WE CLAIM:

1. A positional encoder assembly comprising:

a light source to generate an optical signal;

an optical support structure housing a refractive optic to direct the optical signal, the optical support structure defining a projection;

a lead frame defining a cavity, a hollow within which the light source is disposed, and at least one recess to receive the projection; and

a sensor disposed within the cavity and adapted to generate an electrical signal in response to the optical signal, the electrical signal distributed to a circuit board assembly; wherein the lead frame is disposed on the circuit board assembly such that the sensor is disposed at a predetermined elevation with respect to the circuit board assembly.

2. The positional encoder assembly of claim 1, wherein the sensor is an integrated OPTO-ASIC sensor.

3. The positional encoder assembly of claim 1, further comprising a lead frame contact disposed beneath the sensor.

4. The positional encoder assembly of claim 1, further comprising an external connector protruding from the lead frame, the external connector connectable to the circuit board assembly.

5. The positional encoder assembly of claim 4, further comprising an external connector pad coupled to the external connector.

6. The positional encoder assembly of claim 5, further comprising a wire bond connectable between the sensor and the external connector pad.

7. The positional encoder assembly of claim 1, further comprising an optically transparent encapsulant layer disposed on the sensor.

8. The positional encoder assembly of claim 7, wherein the optically transparent encapsulant layer encapsulates the sensor, the wire bond, and the external connector pad.

9. The positional encoder assembly of claim 7, wherein the optically transparent encapsulant layer is contained within the cavity of the lead frame.

10. The positional encoder assembly of claim 1, further comprising a code disk disposed between the optical support structure and the lead frame.

11. The positional encoder assembly of claim 1, wherein the refractive optic is a prismatic lens.

12. The positional encoder assembly of claim 1, wherein the predetermined elevation is between 0.7 and 1.0 millimeters.

13. The positional encoder assembly of claim 1, wherein the light source is disposed at a second predetermined elevation with respect to the circuit board assembly.

14. The positional encoder assembly of claim 1, wherein the light source is disposed at a second predetermined elevation with respect to the circuit board assembly, and further wherein the second predetermined elevation is greater than the predetermined elevation.

15. A lead frame assembly comprising:

a lead frame defining a cavity;

a lead frame contact disposed within the cavity, and

a sensor disposed on the lead frame contact.

16. The lead frame assembly of claim 15, wherein the sensor is an integrated OPTO-ASIC sensor.

17. The lead frame assembly of claim 15, further comprising an external connector protruding from the lead frame.

18. The lead frame assembly of claim 17, further comprising an external connector pad coupled to the external connector.

19. The lead frame assembly of claim 18, further comprising a wire bond connectable between the sensor and the external connector pad.

20. The lead frame assembly of claim 15, further comprising an optically transparent encapsulant layer disposed on the sensor.

21. The lead frame assembly of claim 20, wherein the optically transparent encapsulant layer encapsulates the sensor, the wire bond, and the external connector pad.

22. The lead frame assembly of claim 20, wherein the optically transparent encapsulant layer is contained within the cavity of the lead frame.

23. The lead frame assembly of claim 15, further comprising a recess in the lead frame for coupling to an optical support structure.

24. The lead frame assembly of claim 15, further comprising a cavity in the lead frame for receiving a light source.

25. The lead frame assembly of claim 24, further comprising a light source disposed within the cavity.

26. The lead frame assembly of claim 25, further comprising a contact disposed between the light source and the cavity.

27. A positional encoder assembly comprising:

a light source to generate an optical signal;

a circuit board assembly;

a lead frame supported upon the circuit board assembly, the lead frame defining a first cavity and a hollow within which the light source is disposed;

a connector positioned above the circuit board assembly and located externally to the lead frame;

a connector pad positioned within a second cavity defined by the lead frame and is electrically connected to the connector;

a sensor disposed within the second cavity supported upon a lead frame contact and adapted to generate an electrical signal in response to the optical signal, the electrical signal distributed to a wire bond that is located within the second cavity and is in electrical contact with the connector pad so that the electrical signal is distributed to the connector and the circuit board assembly; wherein the second cavity

has a height that is above a maximum height of the wire bond and the connector pad is at least as high above the circuit board assembly as a top surface of the sensor.

28. The positional encoder assembly of claim 27, further comprising:

an optical support structure housing a refractive optic to direct the optical signal, the optical support structure defining a projection;

the lead frame defining at least one recess to receive the projection in a snap fit fashion.

29. The positional encoder assembly of claim 27, wherein the sensor is an integrated OPTO-ASIC sensor.

30. The positional encoder assembly of claim 27, further comprising an optically transparent encapsulant layer disposed on the sensor.

31. The positional encoder assembly of claim 30, wherein the optically transparent encapsulant layer encapsulates the sensor, the wire bond, and the connector pad.

32. The positional encoder assembly of claim 30, wherein the optically transparent encapsulant layer is contained within the second cavity of the lead frame.

33. The positional encoder assembly of claim 27, further comprising a code disk disposed between the optical support structure and the lead frame.

34. The positional encoder assembly of claim 28, wherein the refractive optic is a prismatic lens.

35. The positional encoder assembly of claim 27, wherein the light source is disposed at a second predetermined elevation with respect to the circuit board assembly, and further wherein the second predetermined elevation is greater than the first predetermined elevation.

36. The positional encoder assembly of claim 27, wherein the light source lies above the lead frame contact.

37. A positional encoder assembly comprising:

a light source to generate an optical signal;

a circuit board assembly;

a lead frame supported upon the circuit board assembly, the lead frame defining a first cavity within which the light source is disposed;

a connector positioned above the circuit board assembly and located externally to the lead frame;

a connector pad positioned within a second cavity defined by the lead frame and is electrically connected to the connector;

a sensor disposed within the second cavity supported upon a contact and adapted to generate an electrical signal in response to the optical signal, the electrical signal distributed to a wire bond that is located within the second cavity and is in electrical contact with the connector pad so that the electrical signal is distributed to the connector and the circuit board assembly; wherein the second cavity lies below the first cavity.

38. The positional encoder assembly of claim 37, further comprising:

an optical support structure housing a refractive optic to direct the optical signal, the optical support structure defining a projection;

the lead frame defining at least one recess to receive the projection in a snap fit fashion.

39. The positional encoder assembly of claim 37, wherein the sensor is an integrated OPTO-ASIC sensor.

40. The positional encoder assembly of claim 37, further comprising an optically transparent encapsulant layer disposed on the sensor.

41. The positional encoder assembly of claim 40, wherein the optically transparent encapsulant layer encapsulates the sensor, the wire bond, and the connector pad.

42. The positional encoder assembly of claim 40, wherein the optically transparent encapsulant layer is contained within the second cavity of the lead frame.

43. The positional encoder assembly of claim 37, further comprising a code disk disposed between the optical support structure and the lead frame.

44. The positional encoder assembly of claim 38, wherein the refractive optic is a prismatic lens.

45. The positional encoder assembly of claim 37, wherein the light source is disposed at a second predetermined elevation with respect to the circuit board assembly, and further wherein the second predetermined elevation is greater than the first predetermined elevation.

46. The positional encoder assembly of claim 27, wherein the light source lies above the lead frame contact.